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Differences In Gingivitis Students In State Junior High School 3 Gianyar And Kesuma Sari Junior High School Denpasar In 2025

Ni Kadek Santiani[1],I Gede Surya Kencana[2], I Made Budi Artawa[3]
[1,2,3,4] Department of dental health, Poltekkes Kemenkes Denpasar-Bali, Indonesia

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ABSTRACT

Dental and oral diseases are among the most common health problems found in communities worldwide. Gingivitis, as the early stage of periodontal disease, needs to be studied because it can progress into periodontitis if left untreated, leading to tooth loss and decreased quality of life. This study aimed to determine the differences in the severity of gingivitis between students of State Junior High School 3 Gianyar and Kesuma Sari Junior High School Denpasar. This was an observational analytic study with a cross-sectional design. The total sample consisted of 72 students selected by purposive sampling. Data were obtained using the Gingival Index (Löe and Silness) and analyzed using the Chi-Square test ($p \leq 0.05$). The results showed that students of Kesuma Sari Junior High School had higher levels of gingivitis compared to those of State Junior High School 3 Gianyar. It can be concluded that there is a significant difference in the severity of gingivitis between public and private junior high school students.

Keywords: Students; Public and Private Schools; Oral Health.

Corresponding author: imadebudiartawa@gmail.com

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INTRODUCTION

Students represent the next generation and constitute a vital component of future human resources. However, their growth and development may be adversely affected by illness, undernutrition, or psychosocial and mental health problems, which can interfere with learning processes and academic performance. Among these health problems, oral diseases are recognized as major public health concerns globally. The World Health Organization (WHO) reported that oral diseases affect nearly 3.5 billion people worldwide, with dental caries and periodontal disease being the most prevalent conditions (WHO, 2022). Recent global data indicate that the burden of oral disorders has increased by approximately 17% from 1990 to 2021, emphasizing the need for strengthened preventive and promotive oral health programs (Chen et al., 2025).

In Indonesia, the prevalence of gingivitis and other periodontal diseases remains high. The 2018 National Basic Health Research (Riskesdas) showed that 74.1% of the population experienced oral health problems, and the national prevalence of periodontal disease continues to rise (Ministry of Health, 2018; Artagani & Ariestya Milea, 2022). A recent WHO country profile (2022) also identified that about 19.6% of Indonesian adults suffer from severe periodontal disease. This indicates that despite ongoing oral health initiatives, periodontal conditions remain a significant challenge in maintaining overall health and academic productivity among school-age populations.Gingivitis is an inflammatory condition of the gingival tissues (gums) primarily caused by the accumulation of bacterial plaque on the tooth surface. According to the 2018 National Basic Health Research (Riskesdas) report, the prevalence of gingivitis in Indonesia reached 74.1%. This figure is consistent with other findings indicating that nearly 90% of the global adult population has experienced gingivitis, with Indonesia ranking second in terms of periodontal disease prevalence (Artagani & Ariestya Mella, 2022). Epidemiological data further demonstrate that gingivitis is the most common periodontal disease, with higher prevalence observed among males. This disparity has been associated with better oral hygiene practices typically reported among females (Rathee & Jain, 2025). Moreover, a World Health Organization (WHO) survey reported that nearly 90% of the global population suffers from gingivitis, with approximately 80% of cases occurring among children under 12 years of age. In Indonesia, the 2018 Riskesdas data revealed a significant increase in the national prevalence of oral health problems, rising from 25.9% in 2013 to 57.6% in 2018. Poor oral hygiene, which facilitates the accumulation of dental plaque and calculus, has been identified as a major contributing factor that exacerbates the severity of gingival diseases (Pontoluli et al., 2021).

Adolescence, defined as the age range of 10 to 21 years, is a developmental period during which gingivitis is also commonly observed. This stage represents the transition from childhood to adulthood and is characterized by numerous physical and psychological changes. The development of self-identity becomes a central focus during adolescence, accompanied by more rational, abstract, and idealistic thinking. This stage, commonly referred to as puberty, is marked by rapid changes in sexual maturation,

Corresponding author: imadebudiartawa@gmail.com

particularly in early adolescence, as well as significant physical growth and skeletal maturation, including changes in body proportions, weight, and height. According to Monks, Knoers, and Haditono (as cited in Diananda, 2018), adolescence can be classified into four distinct phases: pre-adolescence (10–12 years), early adolescence (12–15 years), middle adolescence (15–18 years), and late adolescence (18–21 years).

According to the 2023 Indonesian Health Survey, oral health problems remain a concern in Indonesia, with the prevalence of bleeding gums reported at 6.8%. In Bali Province, the prevalence of bleeding gums was slightly lower at 4.2%. Within the 10–14 year age group, 6.2% of adolescents in Indonesia were reported to experience bleeding gums. During puberty, typically between the ages of 10 and 15 years, the incidence of gingivitis increases. This is largely attributed to hormonal changes, particularly fluctuations in estrogen and progesterone, which render the gingival tissues more reactive to dental plaque. A study conducted in a junior high school in Palembang reported that 71.9% of students at pubertal age experienced moderate gingivitis. Furthermore, the prevalence of mild to moderate gingivitis is generally high among school-aged children between 11 and 15 years, with rates reaching 81.8% for mild cases and 9.1% for moderate cases (Wicaksono, 2018).

Adolescents at this stage continue to search for self-identity, as their social status remains ambiguous. Patterns of social interaction undergo further transformation, reflecting the ongoing negotiation of autonomy and belonging.d) Late adolescence (19–21 years)**.** In this stage, individuals often seek to become the center of attention and strive to assert themselves, though in ways distinct from those in early adolescence. They tend to be idealistic, highly ambitious, enthusiastic, and energetic. Efforts are directed toward consolidating a stable self-identity and achieving emotional independence.

METHOD

Study Design

This study employed an observational analytic design with a cross-sectional approach.

Population and Sample

The study population comprised all students enrolled at SMP Negeri 3 Gianyar and SMP Kesuma Sari Denpasar. Samples were selected using a purposive sampling technique based on predetermined inclusion and exclusion criteria. At SMP Negeri 3 Gianyar, the sample consisted of 36 students, including 19 males and 17 females. At SMP Kesuma Sari Denpasar, the respondents included 19 males (45.1%) and 17 females.

These two schools were chosen because they represent different geographical areas and socio-economic backgrounds, allowing for broader representation of oral health conditions among junior high school students in Denpasar and Gianyar. Additionally, both schools have active health programs, making them suitable for coordinated data collection. The study was conducted from May to July 2025, coinciding with the academic semester period to ensure optimal student attendance and participation.

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Instruments

The severity of gingivitis was assessed using the Gingival Index (GI) developed by Löe and Silness. This index evaluates gingival inflammation based on three criteria: color, consistency, and the presence of bleeding.

Data Collection

Clinical examinations were conducted directly on students using standard diagnostic tools, including a mouth mirror and a periodontal probe, to assess gingival condition.

Data Analysis

Descriptive statistics were applied to calculate the prevalence and distribution of gingivitis severity in each school. Inferential statistics were performed using the Chi-square test to determine the association between levels of gingivitis severity.

RESULTS

Table 1. presents the characteristics of respondents by gender. At SMP Negeri 3 Gianyar, there were 19 male students (52.8%) and 17 female students (47.2%). At SMP Kesuma Sari Denpasar, respondents consisted of 14 male students (45.1%) and 17 female students (54.9%).

Table 1. Characteristics of Respondents by Gender

School	Male, n (%)	Female, n (%)	Total (n)
SMP Negeri 3 Gianyar	19 (52.8%)	17 (47.2%)	36
SMP Kesuma Sari Denpasar	14 (45.1%)	17 (54.9%)	31

Table 2. shows the distribution of gingivitis severity among seventh-grade students at SMP Negeri 3 Gianyar in 2025. The most common condition was mild inflammation, which was more prevalent among male students (11 students, 57.9%) compared to female students (9 students, 53.0%).

Table 2. Distribution of Gingivitis Severity among Students at SMP Negeri 3 Gianyar by Gender in 2025

Gender	Healthy, n (%)	Mild Inflammation, n (%)	Moderate Inflammation, n (%)	Severe Inflammation, n (%)
Male	2 (10.5%)	11 (57.9%)	5 (26.4%)	1 (5.2%)
Female	4 (23.5%)	9 (53.0%)	4 (23.5%)	0 (0%)

Table 3 presents the distribution of gingivitis severity among students at SMP Kesuma Sari Denpasar in 2025. Among male students, severe gingivitis was found in 5 students (35.1%), while among female students, 3 students (17.6%) experienced severe gingivitis.

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Table 3. Distribution of Gingivitis Severity among Students at SMP Kesuma Sari Denpasar by Gender in 2025

Gender	Healthy, n (%)	Mild Inflammation, n (%)	Moderate Inflammation, n (%)	Severe Inflammation, n (%)
Male	1 (7.0%)	1 (7.0%)	7 (50.0%)	5 (35.1%)
Female	2 (11.7%)	4 (23.5%)	8 (47.2%)	3 (17.6%)

Table 4. compares the overall distribution of gingivitis severity between SMP Negeri 3 Gianyar and SMP Kesuma Sari Denpasar in 2025. At SMP Negeri 3 Gianyar, the majority of students exhibited mild inflammation (20 students, 55%), followed by moderate inflammation (9 students, 25%). In contrast, at SMP Kesuma Sari Denpasar, the majority of students had moderate inflammation (15 students, 48%), followed by severe inflammation (8 students, 26%).

Table 4. Distribution of Gingivitis Severity among Students at SMP Negeri 3 Gianyar and SMP Kesuma Sari Denpasar in 2025

Gingivitis Severity	SMP Negeri 3 Gianyar, n (%)	SMP Kesuma Sari Denpasar, n (%)
Healthy (0)	6 (17%)	3 (10%)
Mild inflammation (0.1–1.0)	20 (55%)	5 (16%)
Moderate inflammation (1.1–2.0)	9 (25%)	15 (48%)
Severe inflammation (2.1–3.0)	1 (3%)	8 (26%)
Total	**36 (100%)**	**31 (100%)**

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Table 5. Distribution of Gingivitis Severity among Students at SMP Negeri 3 Gianyar and SMP Kesuma Sari Denpasar in 2025

Crosstabulation of School and Gingival Index Criteria

School	Healthy	Mild	Moderate	Severe	Total
SMP Negeri 3 Gianyar (Public)	6	20	9	1	36
SMP Kesuma Sari Denpasar (Private)	3	5	15	8	31
Total	**9**	**25**	**24**	**9**	**67**

Table 5. shows that at SMP Negeri 3 Gianyar (Public), the majority of students had mild gingivitis (20 students), whereas at SMP Kesuma Sari Denpasar (Private), most students had moderate gingivitis (15 students).

Based on the Chi-Square test, a significant association was found between school type and gingival index criteria ($p \leq 0.05$). This indicates that the severity of gingivitis differed significantly between students at public and private junior high schools. Furthermore, the Mann-Whitney U test revealed a significant difference in gingival index scores between public and private school students ($p \leq 0.05$). The mean rank of gingival index scores among private school students (1.31) was higher compared to public school students (0.65), suggesting that private school students tended to have more severe levels of gingivitis than their public school counterparts. Since some cells had expected frequencies less than 5, Fisher's Exact Test was used instead of the Chi-Square test to ensure the validity of the statistical analysis for gingival index categories.

DISCUSSION

These results indicate that the majority of students experienced gingivitis in the mild inflammation category. The prevalence of gingivitis was higher among male students compared to female students. This may be attributed to lower levels of oral hygiene awareness among male students, whereas female students tend to be more conscious of self-care. Additionally, hormonal factors during puberty may contribute to an increased risk of gingivitis. However, these findings are not consistent with those reported by Purwaningsih et al. (2021), who found that the incidence of gingivitis was higher among adolescent females than males, and that gingivitis during puberty is influenced by both local and systemic factors, including hormonal changes.

The severity levels of gingivitis among students at SMP Negeri 3 Gianyar were as follows: healthy 6 (17%), mild inflammation 20 (55%), moderate inflammation 9 (25%), and severe inflammation 1 (3%). In comparison, at SMP Kesuma Sari Denpasar the distribution was: healthy 3 (10%), mild inflammation 5 (16%), moderate inflammation 15 (48%), and severe inflammation 8 (26%).The higher prevalence of moderate and severe gingival inflammation at SMP Kesuma Sari, a private school, may be partly explained by

Corresponding author: imadebudiartawa@gmail.com

differences in oral health promotion programs. Public schools often benefit from government-supported dental health initiatives, such as regular dental check-ups and oral health education, which facilitate early detection and prevention of gingivitis. In contrast, private schools may not have comparable programs, or student participation in such initiatives may be lower.The greater severity of gingival inflammation observed at SMP Kesuma Sari is consistent with the view of Dalimunte (in Haryani & Siregar, 2022), who noted that gingivitis can be caused by both local and systemic factors. Local factors include dental calculus, dental plaque, materia alba, dental stains, and debris. Systemic factors include hormonal influences, nutritional disturbances and deficiencies, protein deficiency, certain medications, and hematological diseases such as leukemia and anemia

Similarly, the Mann–Whitney U test showed a significant difference in Gingival Index scores between the two groups (Sig. ≤ 0.05). The mean rank of the Gingival Index among private school students (1.31) was higher compared with public school students (0.65), suggesting that private school students tended to experience more severe gingivitis. A possible explanation is that parents of private school students may be more occupied with work commitments, resulting in less supervision of their children's tooth-brushing habits. Conversely, parents of public school students may be more actively involved in daily routines, including ensuring proper oral hygiene. However, these findings are not consistent with those of Sukhabogi et al. (2024), who reported that public school students had a higher mean Gingival Index (±1.6) compared to private school students (±0.7) ($p < 0.01$). In their study, 90.6% of public school students presented with moderate-to-severe gingivitis, while none of the private school students exhibited severe gingivitis. Public school students also demonstrated higher OHI-S scores, indicating poorer oral hygiene. Several underlying factors may explain why gingivitis severity is often greater among public school students than their private school counterparts, most of which are closely linked to socioeconomic conditions, oral hygiene behaviors, and access to dental health services.

CONCLUSION(S)

This study demonstrates that there are significant differences in the severity of gingivitis between students at SMP Negeri 3 Gianyar (public) and SMP Kesuma Sari Denpasar (private). The findings revealed that students in the public school predominantly experienced mild gingivitis, whereas students in the private school more frequently presented with moderate to severe gingivitis. Statistical analysis using the Chi-Square and Mann–Whitney U tests confirmed a significant association between school type and gingival health status, with private school students showing a higher mean rank of gingival index scores. These results suggest that differences in oral health promotion programs, levels of parental supervision, and awareness of oral hygiene practices may contribute to the observed disparities. Strengthening school-based oral health education and preventive programs, particularly in private schools, is essential to reduce the prevalence and severity of gingivitis among adolescents.

Corresponding author: imadebudiartawa@gmail.com

Conflict of Interest

The author(s) declare that they have no conflict of interest.

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Corresponding author: imadebudiartawa@gmail.com

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Corresponding author: imadebudiartawa@gmail.com